Stengl tree transect Rob Plowes March 2004

This is the first study to quantify the structure of the forests at Stengl. We are interested in the response of the forest to environmental gradients, disturbance & succession, and biotic interactions. For this study we describe changes in composition, density and size class along a 1km transect, and the frequency of fallen or dead trees.

Method

The data was collected using a point quarter method, but modified such that the sample points were the bases of dead or fallen trees. This provides a bias towards increasing the apparent distance to the nearest tree, and therefore a slight reduction in the density.

Results

Table 1. Survey results along transect

	Pine	Blackjack	Post Oak	Juniper	Total or mean
count (excl dead tree)	22	14	33	8	77
% of community	29	18	43	10	
tree density /ha	217	138	325	79	758
mean basal area cm2	494	115	132	98	
basal area m2/ha	1071	159	430	77	1737

17 % of the land surface is solid timber (1737 m^2 tree trunks per hectare).
Pine only comprises 29% of the standing trees compared to 43% Post Oak. But the mean basal area of Pine is much higher and therefore the total basal area of Pines is more than double the quantity of Post Oak.

Fallen trees were encountered at an average spacing of 27.7m. Roughly this gives 13 dead trees per hectare. If the average age of fallen trees is 3 years (??!) then you would expect 4.33 treefalls per hectare per year (and equivalently 4.33 new trees per year). For a stand density of 758 Pine trees/ha, then the average lifespan of a tree would be 175 years. I doubt that this is accurate in this case, since we have a young cohort of trees, hence a small number of treefalls. I have presented the estimate to show the method, rather than having faith in the numbers! As we get a bigger data set, across a longer time period, then the estimate will be refined.

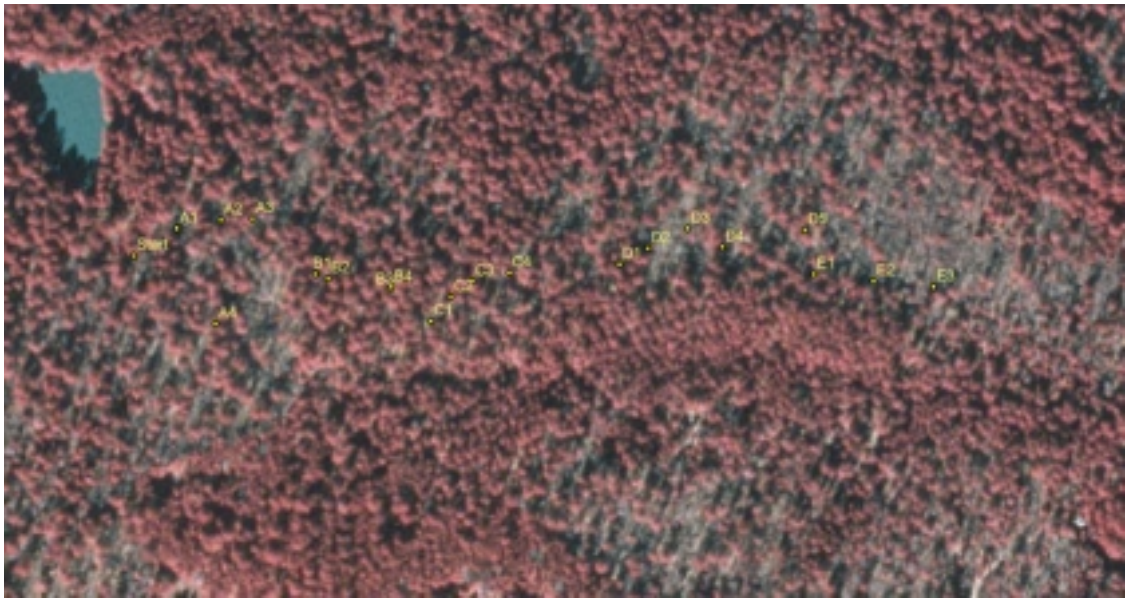

Figure 1. The transect was set about 10 – 20 m North of the track from the pond to the stream. DOQQ color IR airphoto from TNRIS. Red depicts dense vegetation.

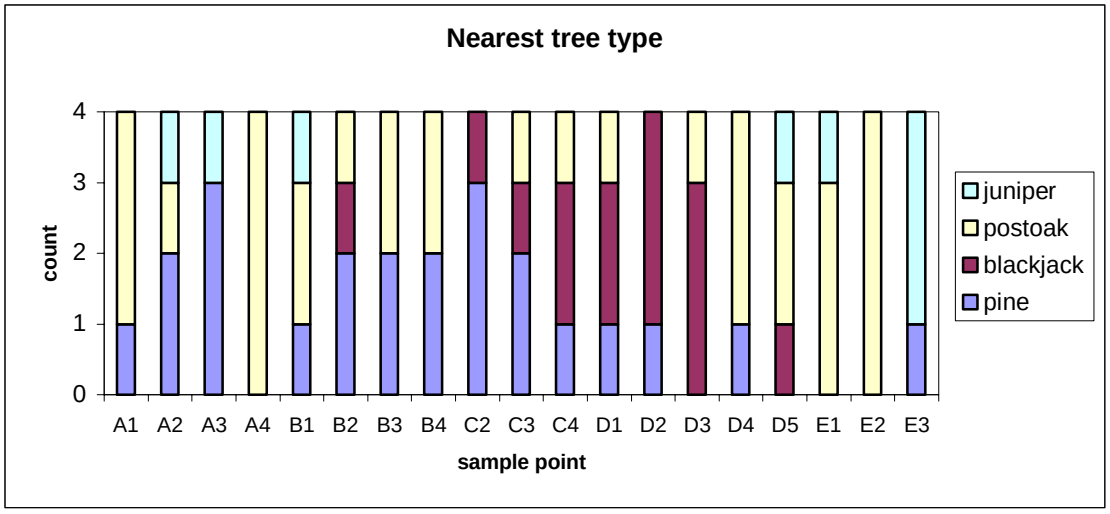

Figure 2. Summary of tree types encountered at each sample point. Note zone of blackjack oaks C2-D5.

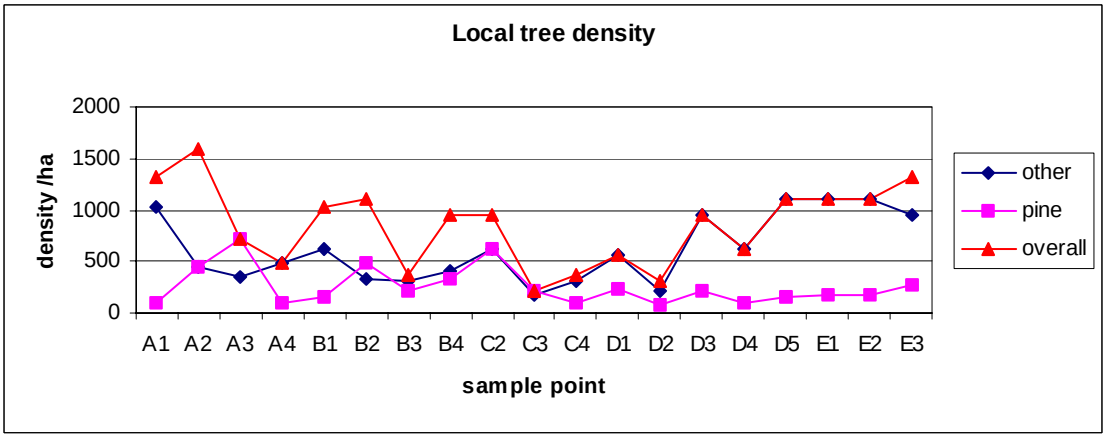

Figure 3. Local tree density along the transect. Note the low density of Pines.